

Effects of Climate Change on Forest Service Strategic Goals

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The U.S. Forest Service, which manages the National Forest System, has a broad goal of sustaining ecosystem health and diversity for future generations. To that end, the Forest Service has identified seven strategic goals for 2007 to 2012. A desired outcome accompanies each goal along with several objectives that will be the Forest Service focus for that goal. The U.S. Global Change Research Program (formerly the U.S. Climate Change Science Program) prepares synthesis and assessment products (SAPs) to support policymaking and adaptation decisions regarding climate change. One of these reports, SAP 4.4, reviewed the potential effects of climate change on the Forest Service's national goals. We summarize that discussion here.

These management goals are affected to some degree by climate change, depending on factors such as the temporal and spatial nature of climate change, the impact of climate change on the ecosystem, and influences of human activity on the ecosystem. Goals are also affected by the interaction of climate change with major stressors as well as assumptions about climate made in current management approaches.

Goal 1: Restore, Sustain, and Enhance the Nation's Forests and Grasslands

Outcome: Forests and grasslands with the capacity to maintain their health, productivity, diversity, and resistance to unnaturally severe disturbance.

Climate change affects forests and grasslands in many ways. Changes in temperature and precipitation affect plant productivity as well as some species' habitat. Changes in key climate variables

affect the length of the fire season and the seasonality of National Forest hydrological regimes. Also, invasive species tend to adapt to climate change more easily and increase extinction risks for native species.

These effects will challenge the objectives of: reducing risk to communities and natural resources from uncharacteristically severe wildfires; reducing adverse impacts from invasive species; and restoring and maintaining healthy watersheds and diverse habitats.



Goal 2: Provide and Sustain Benefits to American People

Outcome: Forests and grasslands with sufficient long-term multiple socioeconomic benefits to meet the needs of society.

The diverse ecosystems within National Forests and grasslands are fundamental to the multiple socioeconomic benefits each forest provides. Climate change affects those ecosystem services, for example, by changing forest and rangeland productivity, which in turn influences biomass availability for livestock and wildlife grazing, for wood products, and/or for energy.

More severe drought or other extreme events may alter this goal because ecosystem composition, structure, and function will change as plant and animal

species respond to climate change.

Private land market-based conservation and stewardship will also be faced with management challenges.

Goal 3: Conserve Open Space

Outcome: Maintain the environmental, social, and economic benefits of forests and grasslands by reducing and mitigating their conversion to other uses.

Working farms, ranches, and private timber lands that surround the National Forests help protect water quality; provide wildlife habitat, timber, and nontimber products; and offer places to recreate. Open space is lost when forests and rangelands are converted to urban and industrial uses. These land-use changes that further reduce the benefits of already problematic forests and grasslands will grow worse as climate change continues to affect ecosystems.

The objective to help private landowners and communities maintain and manage their land as sustainable forests and grasslands will become more difficult as climate change affects ecosystem services as well as the factors that influence land use. For example, the decline in desirability of the land best suited for agriculture or residential development under climate change could result in the conversion of forest and rangelands in other locations to accommodate these development needs.

Goal 4: Sustain and Enhance Outdoor Recreation Opportunities

Outcome: A variety of high-quality outdoor recreation opportunities on the Nation's forests and grasslands are available to the public.

Individual recreational opportunities are often a function of climate.

For example, reduced snowpack might decrease the number of available days for skiing or snowboarding but might increase hiking opportunities or other warm-weather activities. Also, elevated temperatures are likely to reduce cold-water fisheries but may expand warm-water fisheries.

The pressure to provide more recreational opportunities on public land is associated with the projected increase in U.S. population and with the continual decline of public access to privately owned land. The recreation infrastructure, including ski development and reservoirs, is strongly influenced by past and current climate. And climate change will influence the location of recreational opportunities through shifts in snow pack and temperature. Preserving high-quality recreational experiences will depend not only on the condition of the land, current facilities, and transportation infrastructure but also on where such opportunities can be managed under a changing climate.

Goal 5: Maintain Basic Management Capabilities of the Forest Service

Outcome: Administrative facilities, information systems, and landownership management strategies with the capacity to support a wide range of natural resource challenges.

Resource management is already challenging in today's environment—and climate change will increase that challenge. Maintaining technical skills associated with resource management will require the most current information on climate change and its potential impacts to ecosystems. Inventory and monitoring programs and approaches to plan revisions will need to reflect that information to ensure that staffs can make decisions in an uncertain environment.

Goal 6: Engage Urban America With Forest Service Programs

Outcome: Broader access by Americans to long-term environmental, social, economic, and other types of benefits provided by the Forest Service.

The intent of this goal is to better connect urban residents to the value of well-managed public and private forested lands and, through natural resource stewardship, improve the public's quality of life. Climate change will challenge stewardship and programs that directly benefit urban dwellers, such as managing landscapes to reduce risks from wildfire and maintain environmental quality and services like water quality and availability.

Promoting conservation education to increase environmental literacy through partnerships with groups that educate urban populations requires up-to-date information on the potential effect of climate change on public and private lands as well as the urban environment. Effects can be harsh on plants and, with warming temperatures, will place further stress on vegetation. Urban and urbanizing communities likely will need information about the dynamics of the surrounding wildland as climate change alters natural disturbances like wildfire and drought. Urban and community forests will need management strategies that reduce the risks from uncharacteristically severe wildfires, drought, and pest infestations so that these forests will continue to provide benefits to the public.

Goal 7: Provide Science-Based Applications and Tools for Sustainable Natural Resources Management

Outcome: Management decisions are informed by the best available science-based knowledge and tools.

Management practices, technologies, and quantitative tools that do not account for climate change will hinder the ability of National Forest System managers to plan and manage resources. Because climate and natural resource conditions are changing rapidly, existing management tools need to be reviewed and new approaches must be developed to enhance managers' ability to address complex issues facing National Forests, such as linkages among ecosystems, water resources, and regional species migration patterns.

Additional Information

We provide only a brief overview of the National Forest chapter. Additional information on the U.S. Forest Service strategic goals can be found at <http://www.fs.fed.us/publications/strategic/fs-sp-fy07-12.pdf>. Additional information and the scientific background for this overview can be found in SAP 4.4: *Preliminary Review of Adaptation Options for Climate-Sensitive Ecosystems and Resources: A Report by the U.S. Climate Change Science Program and the Subcommittee on Global Change Research*: <http://www.globalchange.gov/publications/reports/scientific-assessments/saps/sap4-4>. For a summary of frequently asked questions about climate change, see *Climate Change and Ecosystems: Summary of Recent Findings*: <http://www.globalchange.gov/images/stories/reports/SAPs/4.4%20brochure.pdf>. For more information about climate change and natural resource management, see the U.S. Forest Service Climate Change Resource Center Web site: <http://www.fs.fed.us/ccrc>.



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